

### **REMARKS**

Claims 1-8 and 10-12 are pending in this application. Claim 9 has been canceled without prejudice.

Claims 1 and 5-7 have been amended to recite that the organic solvent is selected from the group consisting of chain-like saturated hydrocarbons, cyclopentane and cyclohexane. Support for this amendment can be found in page 7, last full paragraph. No new matter has been added by way of the above-amendment.

### **Advantages of the Present Invention**

As noted above, Applicants have amended claims 1 and 5-7 to require that the polyether polymer composition is prepared in a process comprising:

- forming a slurry comprising:
  - an organic solvent,
  - an antioxidant which is insoluble in the organic solvent
  - a stabilizer which is soluble in the organic solvent and
  - a polyether polymer dispersed therein; and then,
- removing the organic solvent from the slurry.

As described in the Examples of the present specification, the above-described polyether polymer composition is structurally distinct from the compositions of the cited art and has an unexpected improvement in storage stability and processing stability.

### **Prior Art Based Issues**

The following prior art based rejections are pending:

(A) Claims 1, 3-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Miura et al. (US Pat. 5,968,681) in view of Lascaud et al. (WO 01/084659) and Ohtsuka et al. (US Pat. 5,840,809). Note: US Publication US 2003/0108799 is being used as an English language equivalent of WO 01/084659 and all references will be directed towards the US document; and

(B) Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Miura et al.

in view of Lascaud et al. and Ohtsuka et al. as applied to claim 1 above, and further in view of Bhatia et al. (JP 08/188653).

Applicants respectfully traverse both rejections.

It appears that the Examiner now newly relies upon the teachings of Ohtsuka et al. for teaching the use of a stabilizer.

We have carefully considered the teachings of the cited references and it appears that the Examiner is not taking into consideration that the presently claimed invention requires a special relationship between the organic solvent, the antioxidant and the stabilizer. Specifically, the presently claimed invention requires the use of an antioxidant which is insoluble in an organic solvent and a stabilizer which is soluble in the same organic solvent.

With respect to the antioxidant compounds, the Examiner relies upon Lascaud et al. for teaching the use of the antioxidant compounds. See paragraphs 0042-0044 and 0054. However, there is no teaching or suggestion in Lascaud et al. to use an antioxidant which is insoluble in an organic solvent. Furthermore, it appears that the antioxidant IRGANOX is *dissolved* (implying that IRGANOX is soluble) in the electrolyte mixture, see paragraph 0054.

With respect to the stabilizer, the Examiner relies on the teachings of Ohtsuka et al. We have reviewed the description beginning at column 8, line 45 to column 9, line 47 of Ohtsuka et al., and there does not appear to be any teaching or suggestion that the stabilizer is soluble in the same solvent which does not dissolve the antioxidant.

Accordingly, a *prima facie* case of obviousness cannot be said to exist over the cited references.

Furthermore, **Miura** discloses a process comprising forming a slurry comprising an organic solvent and a polyether polymer dispersed therein and removing the organic solvent. However, Miura does not teach adding an antioxidant nor a stabilizer to the slurry.

**Lascaud** teaches adding a hindered amine antioxidant to a polyether composition. Lascaud specifically discloses IRGANOX as antioxidant (Examples 1 and 2; [0054], [0058]). It is submitted that IRGANOX antioxidant is soluble in a chain-like saturated hydrocarbon such as n-hexane (typical medium for preparing a slurry of polyether polymer) (please see page 22 of the specification of

the present application). Lascaud teaches nothing about the use of an antioxidant which is insoluble in the organic solvent contained in a slurry of polyether polymer.

**Ohtsuka** discloses an epoxidized block copolymer obtained by epoxidizing a block copolymer comprising vinyl aromatic hydrocarbon polymer blocks and conjugated diene polymer blocks, or a hydrogenation product thereof (col. 1, lines 44-53; claim 1). It is submitted that the epoxidized block copolymer has an epoxy structure introduced in the conjugated diene polymer blocks of the block copolymer, but, this epoxidized block copolymer is distinguished from a polyether polymer. The polyether polymer is defined as a polymer having ether repeating structural units  $-C_nH_{2n}O-$  in the backbone of polymer.

In addition, although Ohtsuka teaches the incorporation of phenolic stabilizers and phosphorus stabilizers (col. 9, lines 1-47), Ohtsuka has no technical concept of using only those which are soluble in the organic solvent contained in the copolymer slurry.

Ohtsuka discloses an epoxidized block copolymer, but is silent on a polyether polymer. Therefore there is no reason why one skilled in the art would combine Ohtsuka with Lascaud. Even if Lascaud is combined with Ohtsuka, the combination does not suggest the incorporation in a polyether polymer slurry of an antioxidant which is insoluble in the organic solvent contained in the polymer slurry, in combination with a stabilizer which is soluble in the same organic solvent.

The instantly claimed process results in a polyether polymer composition as claimed in claim 6, which is characterized as (1) a predominant part of the antioxidant being deposited on the surface of polymer particle, (2) a predominant part of the stabilizer existing within the polymer particle, and (3) the polyether polymer having a gel content of not larger than 5% by weight. This polyether polymer composition has benefits such that, when it is stored for a long period or it is shaped into a film, for example, by a melt-extrusion procedure, it is not easily subject to the reduction of molecular weight due to polymer chain scission, nor readily gelled.

The above-mentioned characteristics and benefits of the polyether polymer composition as obtained by the process of the present invention are believed to be unexpected from Miura, Lascaud and Ohtsuka.

With respect to obviousness, in the presently claimed invention, it is important firstly that a stabilizer, which is soluble in an organic solvent in the slurry of a polyether polymer, is

incorporated in the polyether polymer slurry. This can be seen in the data of Table 2 of the present specification which is reproduced in the following Table for the Examiner's convenience.

Table

	Ex. 4	Ex. 5	Ex. 7	Com.Ex. 3
Polyether polymer	EO/PO/AGE	EO/PO/AGE	EO/PO/AGE	EO/PO/AGE
Stabilizer	Yes/soluble	Yes/soluble	Yes/soluble	Yes/insoluble
Antioxidant	No	No	Yes	No
Solvent in slurry	n-hexane	n-hexane	n-hexane	n-hexane
Gel content after heat-drying (%)	0.1	0.1	0	6.5
Gel content after kept in nitrogen atmosphere for 70 hrs (%)	0.1	0.2	0	8.2
Gel content after kneading by Brabender (%)	0.2	0.3	0.1	10.1

As seen from the comparison of Examples 4 and 5 with Comparative Example 3 in the above-Table, in the case when the stabilizer is insoluble in the organic solvent in the slurry of polyether polymer, the resulting polyether polymer composition exhibits an undesirably large gel content, and, when the polymer composition is stored in a nitrogen atmosphere or kneaded by Brabender Plastometer, the gel content is increased (Comparative Example 3).

Secondly it is important that the soluble stabilizer is incorporated in combination with an insoluble antioxidant in the polyether polymer slurry. As shown in Examples 4 and 5 in the above-Table, even though a stabilizer, which is soluble in an organic solvent in the slurry of a polyether polymer, is used, the gel content of polymer as measured after heat-drying is 0.1 wt.% by weight, that as measured after kept in nitrogen atmosphere for 70 hours is 0.1 or 0.2 wt.% and that as measured after being kneaded by Brabender Plastometer is 0.2 or 0.3 wt.%. In contrast, as shown in Example 7, when the soluble stabilizer is used in combination with an insoluble antioxidant, the gel content of polymer as measured after heat-drying is 0 wt.% by weight, that as measured after kept in nitrogen atmosphere for 70 hours is 0 wt.% and that as measured after kneaded by Brabender Plastometer is 0.1 wt.% (see also page 29, second paragraph).

Accordingly, clear patentable distinctions exist between the present invention and the teachings of the cited references and withdrawal of the rejections is respectfully requested.

**Conclusion**

Entry of the above amendments is earnestly solicited. An early and favorable first action on the merits is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen (Reg. No. 43,575) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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